UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,907	09/17/2003	Ying Tat Leung	YOR920030350 (00280746AA)	2648

			EXAMINER
30743	7590	06/01/2006	CHEN, TE Y

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ART UNIT	PAPER NUMBER
2161	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/663,907	LEUNG ET AL.
	Examiner	Art Unit	
	Susan Y. Chen	2161	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on __.
2a) ☐ This action is **FINAL.** . 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-10* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-10* is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on *17 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/17/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-10 are presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The following claimed term is lacking of antecedent basis:

"the historical behavior" – claims 1 and 6.

Furthermore, applicant fails to define metes and bounds of the claimed subject matter "reliability theory" [i.e., claim 1, line 6 & claim 6, line 15], hence it renders these claims indefinite. For the purpose this examination, the examiner assumes that any theory being used to calculate each component failure read on the claimed reliability theory.

As to claims 2-9, these claims have the same defects as their base claims respectively, hence are rejected for the same reason.

Because the ambiguous nature of instant invention, the following art rejection is

to the best of the examiner ascertain.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-10, are rejected under 35 U.S.C. 102(e) as being anticipated by U.S.

Publication No. 2004/0250166 issued to Dahlquist et al. (hereinafter referred as

Dahlquist).

Claim 1:

Dahlquist discloses the method to diagnose equipment failures using an

integrated approach of case-based reasoning and reliability analysis [e.g., Abstract,

Fig(s) 1-7 and associated texts], comprising the steps of:

maintaining a case base database for the equipment [e.g., the unit: 31, Fig. 2; 24,

Fig. 3 and 24, Fig. 4 and associated texts];

receiving an equipment problem description from a user [e.g., the units: 22, 23, 25, etc, Fig. 3 and associated texts; page 2, the sections: 0027-0031 & page 4, sections 0050-0052];

for each component in the equipment, calculating failure probability based on historical failure and published data, using reliability theory [e.g., Page 4, sections 0053-0055];

for each component, calculating probability of matching problem description assuming that a component fails, using case based reasoning [e.g., the unit 35 of Fig. 2 , and the unit 35 of Fig. 5 and associated texts & Page 4, section 0056];

for each component, combining the calculated probabilities to compute the overall failure probability given the historical behavior and published data and problem description [e.g., Page 4, sections 0053-0057]; and

composing a list of component recommendations by ranking components by their overall failure probabilities and retrieving corresponding past solutions from the case base [e.g., Page 1, section 0012 & Page 4, section 0053, Fig. 6 and associated texts].

Claim 2:

Except the features recited in claim 1, Dahlquist further discloses that the step of producing a single list of suggested failed components based on published failure data, historical failure behavior as observed by the equipment user, and the problem description specified by the user [e.g., Fig. 6 and associated texts & Page 6, section 0076].

Claim 3:

Except the features recited in claim 1, Dahlquist further discloses that the step of producing a list of probabilities of failure corresponding to the list of suggested failed components, with the probabilities estimated from published failure data, historical failure behavior as observed by the equipment user, and the problem description specified by the user [e.g., Fig. (s) 2 & 6 and associated texts].

Claim 4:

Except the features recited in claim 1, Dahlquist further discloses that the step of combining probabilities to compute overall failure probability uses an equipment hierarchy such that component failure probabilities are estimated in a hierarchical manner, calculated from data for the equipment at hand, if there is adequate data, otherwise, from data from an equipment group one level up in the hierarchy, and repeating the process until adequate data is found [e.g., Page 6, sections: 0082-0087 & the top-down plant hierarchy by case based reasoning for fault detection, or the down-up plant hierarchy by Bayesian inference for root cause analyzing of Fig. 5 and associated texts].

Claim 5:

Except the features recited in claim 1, Dahlquist further discloses that the step of combining probabilities to compute overall failure probability uses an equipment

hierarchy such that historical cases are retrieved in a hierarchical manner, from data for

the equipment at hand, if there is adequate data, otherwise, from data from an

equipment group one level up in the hierarchy, and repeating the process until adequate

data is found [e.g., Page 4, sections: 0054-0055, Page 5, sections: 0063-0065, Page 6,

sections: 0082-0083 & Fig(s). 4-5 and associated texts].

Claim 6:

Dahlquist discloses a decision support system to diagnose equipment failures

using an integrated approach of case-based reasoning and reliability analysis [e.g.,

Abstract, Fig(s) 1-7 and associated texts], comprising:

a case base maintenance management system database for the equipment; a

decision support system database [e.g., the unit: 31, Fig. 2; 24, Fig. 3 and 24, Fig. 4 and

associated texts];

a decision support system client for receiving an equipment problem description

from a user [e.g., the units: 22, 23, 25, etc, Fig. 3 and associated texts; page 2, the

sections: 0027-0031 & page 4, sections 0050-0052];

a decision support system server receiving input from the decision support

system client and accessing said maintenance management system database and said

decision support system database, said decision support system server including [e.g.,

Fig. (s) 2-6 and associated texts]:

a real-time decision support system engine for calculating failure

probability for each component in the equipment, based on historical failure and

published data, using reliability theory, and for calculating probability of matching

problem description for each component, assuming that a component fails, using

case based reasoning, and for each component, combining the calculated the

calculated probabilities to compute the overall failure probability given the

historical behavior and published data and problem description and composing a

list of component recommendations by ranking components by their overall

failure probabilities and retrieving corresponding past solutions from the case

base [e.g., Page 5, section 0070 - page 6, section 0076 & Fig.(s) 3-6 and

associated texts]; and

a case base update processor for copying closed failure transaction

records from the maintenance management systems database, and extracting

the information these transaction records to the attributes required by said

decision support system engine, and indexing each transaction record by the

failed component identification and the number of occurrence of failure of that

particular component [e.g., the database 24 real-time updating at Page 5, section

0070-0071, the diagnostics data extracting at Page 5, sections: 0063-0065, the

hierarchical indices of the case based decision control system (DCS) at Page 6,

sections: 0079-0085 & the ranking, propagating and replacing "the

malfunctioning pump with a new one technique" of the decision support tool at

Page 7, section 0091-0095, Fig.(s) 2-7 and associated texts].

Claim 7:

Except the features recited in claim 6, Dahlquist further discloses that the

decision support system server produces a single list of suggested failed components

based on published failure data, historical failure behavior as observed by the

equipment user, and the problem description specified by the user [e.g., Fig. 6 and

associated texts & Page 6, section 0076].

Claim 8:

Except the features recited in claim 6, Dahlquist further discloses that the

decision support system server produces a list of probabilities of failure corresponding

to the list of suggested failed components, with the probabilities estimated from

published failure data, historical failure behavior as observed by the equipment user,

and the problem description specified by the user [e.g., Fig. (s) 2 & 6 and associated

texts].

Claim 9:

Except the features recited in claim 6, Dahlquist further discloses that the

decision support system server combines probabilities to compute overall failure

probability uses an equipment hierarchy such that component failure probabilities are

estimated in a hierarchical manner, calculated from data for the equipment at hand, if

there is adequate data, otherwise, from data from an equipment group one level up in

the hierarchy, and repeats the process until adequate data is found [e.g., Page 6,

sections: 0082-0087 & the top-down plant hierarchy by case based reasoning for fault

detection, or the down-up plant hierarchy by Bayesian inference for root cause

analyzing of Fig. 5 and associated texts].

Claim 10:

Except the features recited in claim 6, Dahlquist further discloses that the

decision support system server combines probabilities to compute overall failure

probability uses an equipment hierarchy such that historical cases are retrieved in a

hierarchical manner, from data for the equipment at hand, if there is adequate data,

otherwise, from data from an equipment group one level up in the hierarchy, and

repeats the process until adequate data is found [e.g., Page 4, sections: 0054-0055,

Page 5, sections: 0063-0065, Page 6, sections: 0082-0083 & Fig(s). 4-5 and associated

texts].

Conclusion

To expedite the process of examination, the examiner requests that all future

correspondences in regard to overcoming prior art rejections or other issues (e.g. 35

U.S.C. 112) set forth by the Examiner prior to the office action, that applicant should

provide and link to the most specific page and line numbers of the disclosure where

best support is found (see 35 U.S.C. 132).

The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure:

1) Smith et al. (U.S. Publication No. 2003/0061212) which discloses a method and apparatus for analyzing manufacture data via data mining.

2) Yang et al. (U.S. Publication No. 2003/0208514) which discloses a method and apparatus for decision making via a plurality of assed criteria.

3) Hekmatpour (U.S. Patent No. 6,584,455) which discloses a system with method for predicting design errors in integrated circuits.

4) Wyss (U.S. Patent No. 6,125,453) which discloses a cut set-based risk and reliability analysis for arbitrarily interconnected networks.

Points of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Y. Chen whose telephone number is 571-272-4016. The examiner can normally be reached on Monday - Friday from 7:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Susan Y Chen
Examiner
Art Unit 2161

May 15, 2006